IS 8003 (2008): Specification for Wheel Axle Assemblies for Mine Cars [MED 8: Mining Techniques and Equipment]

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भारतीय मानक

# माइन कारों की पहिया धुरी की ऐसेम्बली — विशिष्टि

( पहला पुनरीक्षण )

# *Indian Standard*
# WHEEL AXLE ASSEMBLIES FOR MINE CARS — SPECIFICATION
# *(First Revision)*

ICS 01.040.73



B U R E A U OF I N D I A N STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*December* 2008

Price Group 4

Mining Techniques and Equipment Sectional Committee, MED 08

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Mining Techniques and Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in May 1976. The experience gained in implementation of this standard necessitated its revision.

In this standard wheel axle assemblies are classified into two types, namely, Type 1 for use in coal mines, and Type 2 for use in metal mines. Non-preferred sizes of rail gauge 762 mm and 1 067 mm have been deleted in this revision. Further capacities are made applicable from '0.75 $m^3$ and above' in place of '1.5 $m^3$ and above' and dimensions of rail gauge are modified as '600 mm, 610 mm, 900 mm and 1 000 mm'.

While formulating this standard considerable assistance has been derived from DIN 20553 : 1989 'Wheel sets with taper roller bearings for mines cars', issued by Deutsches Institut fur Normung.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 *:* 1960 'Rules for rounding off numerical values *(revised)**. The number of significant places retained in the rounded off value should be die same as that of the specified value in this standard.

# *Indian Standard*

# WHEEL AXLE ASSEMBLIES FOR MINE CARS SPECIFICATION

## *(First Revision)*

### 1 SCOPE

This standard covers the requirements for the wheel axle assemblies for mine cars of capacities 0.75 $m^3$ and above.

### 2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

### 3 TYPES

The wheel axle assemblies covered in this standard are classified into two types:

a) Type 1: For coal mines

b) Type 2: For metal mines

### 4 DIMENSIONS

#### 4.1 Rail Gauge *G*

Wheel axle assemblies shall be manufactured for rail gauges of 600 mm, 610 mm, 900 mm and 1 000 mm.

#### 4*2* Wheel Axle Assembly

**4.2.1** The dimensions of wheel axle assembly shall be as given in Fig. 1 for use in coal mines and as given in Fig. 2 for use in metal mines.

**4.2.2** Other general requirements shall be as given below:

| *Mass of Laden Mine Car, Tonnes Max* | *Axle Size A* | *Hub Size B* | *Hub Dia C* | *Designation of Bearing* |
|---|---|---|---|---|
| 4 | 75 | M48 x 1.5 | 155 | 60 KB 22 |
| 5 | 75 | M52 x 1.5 | 165 | 65 KB 22 |
| 6.5 | 80 | M56x2 | 170 | 70 KB 22 |
| 9 | 100 | M64x2 | 185 | 80 KB 22 |

#### 4.3 Tolerances

**4.3.1** For running at speeds of less than 15 km/h, the wheel tread diameter shall have a tolerance of ±1 mm.

**4.3.2** For safe running at all speeds of 15 km/h and above, the following maximum deviations may be permitted:

a) Wheel tread diameter : ± 0.5 mm

b) Tolerance of form for wheel : 1mm

c) Tread diameter and flange
radial run out of wheel tread : 0.3 mm. *Max*

### 5 MATERIAL

Material for various parts shall be as given below:

| *Part* | *Material Conforming to* |
|---|---|
| Wheel | IS 276 or IS 1030 or IS 2707 or Grade 3 of IS2708 |
| Axle | 45 C8 of IS 13352 or Class 4 of IS 1875 |
| Hub cap | IS 1030 |
| M12 Hexagonal bolt and nut with washer | IS 1363 (Part 1) and IS 1363 (Part 3) |
| Clamp 65 mm x 10 mm | IS 2062 |

### 6 HARDNESS

The wheel shall have a hardness of 180 to 240 HB (=190 to 250 *HV)* at the wheel tread and flange after heat treatment.

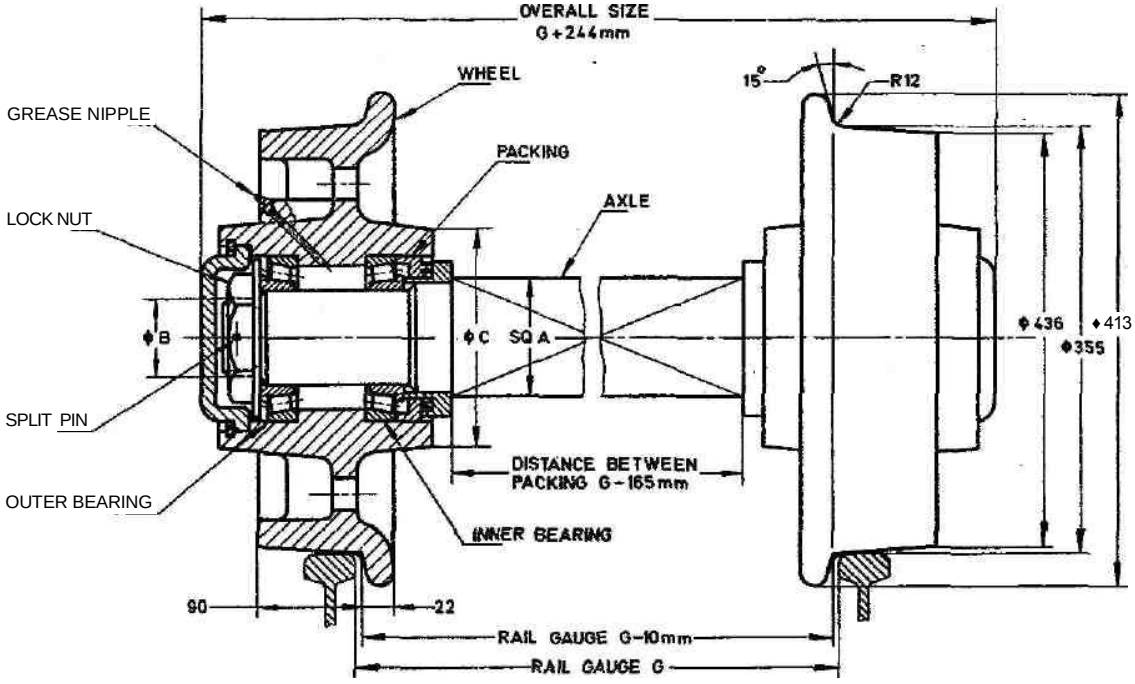
### 7 GENERAL REQUIREMENTS

**7.1** The bearings shall conform to dimension series 3 EC of IS 7461 (Parti).

**7.2** The axle and bearing housing shall be machined to the limits appropriate to the class of tolerances used on the bearing.

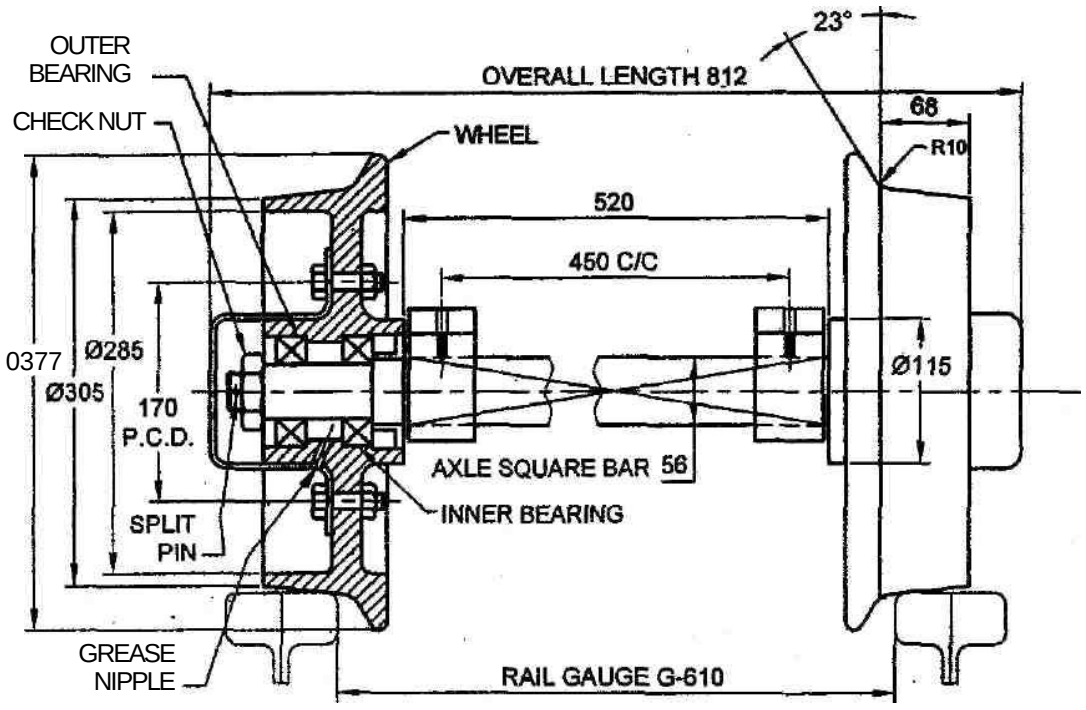
**7.3** The bearings shall appropriately be protected against penetration of water and dust.

**7.4** For the purpose of lubrication of bearings, button head grease nipples of M1G x 1 size conforming to IS 4009 (Part 1) shall be fixed on each wheel.




All dimensions in millimetres.

FIG. 1 WHEEL ASSEMBLY FOR COAL MINES




All dimensions in millimetres.

FIG. 2 WHEEL ASSEMBLY FOR METAL MINES

**7.5** Nuts shall be locked to prevent unscrewing. Split pins used for nut locking shall be of 6.3 mm size *(see* IS 549).

**7.6** Arrangements shall be made on the assemblies so that in the event of breakage of bearings, the wheel shall not get separated from the axle.

## 8 HEAT TREATMENT

### 8.1 Wheels

#### 8.1.1 *Carbon Steel and Pearlitic Manganese Steel Castings*

All castings shall be either annealed or normalized or hardened and tempered at suitable temperatures to give optimum mechanical properties.

#### 8.1.2 *Austenite Manganese Steel Castings*

All castings shall be heat treated, having been water quenched from a temperature of not less than 1000°C, to give the optimum mechanical properties.

8.2 Axle

Axle shall be normalized.

## 9 DESIGNATION

A wheel axle assembly for rail gauges of 900 mm and suitable for mine cars of 6.5 tonnes mass when laden shall be designated as:

Wheel axle 900 x 6.5 IS 8003.

## 10 MARKING

**10.1** Each wheel axle assembly shall be marked with the following information:

a) Maximum mass of laden car for which the assembly is suitable,
b) Rail gauge, and
c) Manufacturer's identification mark.

### 10.2 BIS Certification Marking

The wheel axle assembly may also be marked with Standard Mark.

10.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which a licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## ANNEXA

*{Clause* 2)

## LIST OF REFERRED INDIAN STANDARDS

| *IS No.* | *Title* |
|---|---|
| 276:2000 | Austenitic — Manganese steel castings — Specification *(fifth revision)* |
| 549 : 1974 | Specification for split pins *{second revision)* 1030: 1998 Carbon steel castings for general engineering purposes *(fifth revision)* |
| *1*363 | Hexagon head bolts, screws and nuts of product grade 'C (Part 1): 2002 Hexagon head bolts (size range M5 to M64) *(fourth revision)* (Part 3): 2002 Hexagon nuts (size range M5 to M64) *(fourth revision)* |
| 1875 :1992 | Carbon steel billets, blooms, slabs and bars for forgings *(fifth revision)* |
| 2062:2006 | Hot rolled low, medium and high tensile structural steel *{sixth revision)* |
| 2707:1996 | Carbon steel castings for surface hardening -— Specification *(fourth revision)* |
| 2708 : 1993 | 1.5 percent manganese steel castings for general engineering purposes . *(third revision)* |
| 4009 (Part 1) : 1981 | Specification for grease nipples : Part 1 Button head grease nipples *(first revision)* |
| 7461 (Part 1): 1993 | General plan of boundary dimensions for tapered roller bearings : Part 1 Single row bearings *(second revision)* 13352 : 1992 Stock for forgings produced from continuously cast billets, blooms, slabs and bars — Specification |

# ANNEX B

*(Foreword)*

## COMMITTEE COMPOSITION

### Mining Techniques and Equipment Sectional Committee, MED 8

| *Organization* | *Representative(s)* |
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| Directorate Genera! of Mines Safety, Dhanbad | SHRI J. P. K ASH YAP *(Chairman)* SHRI MuKHiiRJUii *(Alternate)* |
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**Amendments Issued Since Publication**

| Amend No. | Date of Issue | Text Affected |
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